

ABCNET: LITERACY TOOL BASED ON ENTITIES

Óscar Narciso Mortágua Pereira,
Joaquim Manuel Henriques de Sousa Pinto
IEETA – University of Aveiro, Campus Santiago, 3810-193 Aveiro, Portugal
{oscar, jso}@ieeta.pt

ABSTRACT

In the 21st century the demanding for reading and writing capabilities will increase not only in the children but also in the adult generation. For adults, their level of literacy will determine the job they may get, the way they will behave as citizens, the way they will grow up their own children, etc. Literacy is the basic key tool for a successful future. Information requires literacy information is being redirected to the internet, requiring not only additional investments but also additional skills. The skills to deal with new technologies is the new challenge for the 21st century. abcNet is a web based application which aims at teaching how to read and write.

KEYWORDS

abcNet, literacy, Paulo Freire, e-learning

1. INTRODUCTION

Reading is a very elaborated process and it gathers: 1) grapheme recognition and individualization; 2) its association to the correspondent phonemes; 3) auditive and visual analysis and synthesis of the several word elements and the word as a whole; 4) continuous combination of both; 5) word understanding. Several methods have been presented to achieve better results in the process of learning how to read and write: 1) structural methods such as the synthetic method and analytic method; 2) phonic methods such as syllabic method and phonogram method. In the teaching practice, combination of several methods is applied to reach the goal. In this document it is presented an approach to an application which aims at implementing a flexible platform, allowing the teacher to decide, in each moment, which contents and which combination of methods to use.

abcNet is a web based platform which aims at putting at one's disposal contents to be used in the teaching how to read and write. abcNet architecture is based on two structural elements: basic entities and teaching entities.

2. BASIC ENTITIES

Basic entities are the most elementary learning entities. abcNet basic entities types are:

- phonic entities: these entities are mainly made by audio files and include alphabetic letters, phonemes, groups of letters, syllables, words and phrases
- text entities: these entities are mainly made by text and include letters, group of letters, syllables, words and phrases
- image entities: these entities are mainly made by image files

These entities are not hard-coded, they are kept in a database in order to achieve full abcNet configuration flexibility. Phonic and text entities may be combined in order to achieve specific goals in terms of reading and writing.

3. TEACHING ENTITIES

Teaching entities are the fundamental teaching structure in abcNet. A teaching entity can be seen as an abstract entity which is composed by two sub-entities: the teaching template and the teaching unit. The teaching templates are the interfaces where the teacher may configure the information to be used in a teaching unit. The teaching units are the interfaces where the students learn how to read and write. A teaching unit consists of a set of one or more forms with which the students interact and work to achieve certain goals in terms of how to read and write. Each teaching unit results from a configuration of a teaching template where the teacher may choose which basic entities are required to achieve a particular goal. From each one of the teaching templates, configured by the teacher, abcNet will generate automatically the correspondent teaching unit. We may say that a course planning requires the following stages: a) select which teaching templates to use; b) configure each teaching template to obtain one or more teaching units; c) order the teaching units. We should notice that one teaching template may be configured as many times as necessary in order to generate as many teaching units as necessary.

This paper is focused on two teaching entities: teaching entity Wr1, which will be described in some detail, and teaching entity Wr2. These two teaching entities are mainly focused on the process of teaching how to write. This does not mean that the goal of teaching how to read cannot be achieved by these entities.

3.1 Teaching Entity Wr1

Teaching entity Wr1 is focused on the process of teaching how to write and it is based on Paulo Freire's method. It starts from a word and through its family syllables proposes new words to be written by the student. Paulo Freire presents the accomplishment of his method in five steps: 1) studying of the vocabulary used by the students; 2) selecting the generating words; 3) recreating real scenarios; 4) programming the course; 5) creating tests with words broken apart in their syllables. Steps 1, 2 and 3 must be accomplished by the teacher; steps 4 and 5 are also accomplished by the teacher but through abcNet teaching entity Wr1.

Teaching entity Wr1 is divided into two other sub-entities: 1) teaching template Wr1 which aims at configuration of the teaching units Wr1; 2) teaching unit Wr1 which aims at teaching how to read and write.

3.1.1 Teaching Template Wr1

The configuration process requires the selection of information in order to achieve the goals of teaching how to read and write through the teaching unit Wr1. Teaching template Wr1 requires that the teacher sets the following information: 1) one generating word; 2) one image to be associated with the generating word; 3) besides the family syllable group, other groups of syllables to be used in the process of construction of new words; 4) up to 15 ordered words to be built by the students. Besides this information, the correspondent teaching unit Wr1 will present automatically the following information: 1) generating word divided in its syllables, family syllables of all generating word syllables. Each teaching template and unit is recognized through not only by its type but also by a description.

Figure 1 presents the teaching template Wr1 where the teacher sets:

- the description: Wr1 – lago
- the generating word: lago (lake)
- the image to be associated with the generating word: lago_1_2.jpg
- usage of all groups of syllables for new words construction
- 8 ordered words to be built by the students in the teaching unit Wr1 known as Wr1 – lago



Figure 1. The teaching template Wr1

3.1.2 Teaching Unit Wr1

Teaching units Wr1 are those derived from the configuration process of the teaching template Wr1. The teaching template Wr1 may generate as many teaching units Wr1 as necessary. Each teaching unit Wr1 has a unique tag description for an unique identification. Teaching unit Wr1 is a direct translation of Paulo Freire's method where the nuclear element is a generating word. The generating word family syllables are used by the student to build new words. abcNet target public doesn't know how to read and write and probably has never used a computer. Special care must be taken with the implementation of the teaching units interfaces. The most important elements of teaching unit Wr1 are:

1. a generating word presented as an interactive element with the following features:
 - a. the element changes its colour with the mouse over event
 - b. the element presents the written word
 - c. the student may hear the word pronunciation by clicking on the element
 - d. by holding the mouse over the element for at least 2 seconds, the student may listen to what he can do with the element: c)
2. ordered syllables of the generating word; each syllable is presented as an interactive element with the following features:
 - a. the element changes its colour with the mouse over event
 - b. the element presents the written syllable
 - c. the student may hear the syllable pronunciation by clicking down the element
 - d. by holding the mouse over the element for at least 2 seconds, the student may listen to what he can do with the element: c)
3. an image associated with the generating word
4. family syllables of each generating word syllables; each syllable is presented as an interactive element with the following features:
 - a. the element changes its colour with the mouse over event
 - b. the element presents the written syllable
 - c. the student may hear the syllable pronunciation by clicking on the element
 - d. the student may activate the syllable by clicking on the element; activating a syllable means setting the syllable in a pre-selection for the new word to be built

- e. by holding the mouse over the element for at least 2 seconds, the student may listen to what he can do with the element: c) and d)
5. other groups of syllables as homographs, homophonous and adjacent; each syllable is presented as an interactive element with the following features:
 - a. the element changes its colour with the mouse over event
 - b. the element presents the written syllable
 - c. the student may hear the syllable pronunciation by clicking on the element
 - d. the student may activate the syllable by clicking on the element; activating a syllable means setting the syllable in a pre-selection for the new word to be built
 - e. by holding the mouse over the element for at least 2 seconds, the student may listen to what he can do with the element: c) and d)
6. active syllable for the construction of the proposed word; the syllable is presented as an interactive element with the following features:
 - a. the element changes its colour with the mouse over event
 - b. the element presents the written syllable
 - c. the student may hear the syllable pronunciation by clicking on the element
 - d. by holding the mouse over the element at least 2 seconds, the student may listen to what he can do with the element: c)
7. ordered syllables of the word to be built where the student may select the activated syllable; each syllable is presented as an interactive element with the following features:
 - a. the element changes its colour with the mouse over event
 - b. selection of an active syllable is achieved by double clicking the element
 - c. while there is no selected syllable, the element presents the character ? written down; after a syllable selection, the element presents the written syllable whether it is correct or not
 - d. if there is a selected syllable, the student may hear its pronunciation by clicking on the element
 - e. by holding the mouse over the element for at least 2 seconds, the student may listen to what he can do with the element: b) and d)
8. ordered syllables of the word to be built; each syllable is presented as an interactive element with the following features:
 - a. the element changes its colour with the mouse over event
 - b. while all the word syllables aren't correctly selected, the element presents the character ? written down; after all the word syllables are correctly selected, the element presents the syllable written down
 - c. the student may hear the syllable pronunciation by clicking down the element
 - d. by holding the mouse over the element at least 2 seconds, the student may listen to what he can do with the element: c)
9. the word to be built which is presented as an interactive element with the following features:
 - a. the element changes its colour with the mouse over event
 - b. while all the word syllables aren't correctly selected, the element presents the character ? written down; after all the word syllables are correctly selected, the element presents the written word
 - c. the student may hear the word pronunciation by clicking on the element
 - d. by holding the mouse over the element for at least 2 seconds, the student may listen to what he can do with the element: c)
10. words already built by the student in the present unit; each word is presented as an interactive element with the following features:
 - a. the element changes its colour with the mouse over event
 - b. the element presents the word written down; the exception is made for the current word which is presented by the character ?
 - c. the student may hear the word pronunciation by clicking on the element
 - d. by holding the mouse over the element for at least 2 seconds, the student may listen to what he can do with the element: c)



Figure 2. The teaching unit Wr1

When the student completes the construction of all the proposed words, he may go to the next planned teaching unit.

Figure 2 presents the teaching unit Wr1 – lago, which corresponds to the teaching template presented before. In Figure 2 we can see: 1) top – left: a summary description of the teaching units Wr1, 2) top – center: an image associated with the generating word, 3) top – right: the generating word and its ordered syllables, 4) centre – left: the family syllables of the generating word syllables, 5) centre – centre: other groups of syllables to be used, 6) center – right, top-down: a) active syllable (go), b) selected syllables for the word to be built, c) syllables of the word to be built, which are presented because the student had just completed successfully the word building, d) the word to be built which is presented because the student had just completed successfully the word construction, 7) down: the first seven words built and the one under construction.

3.2 Teaching Entity Wr2

Teaching entity Wr2 may seem very similar to teaching entity Wr1 but it has some slight differences with great impact on the goals to be achieved. Teaching entity Wr1 is focused on a generating word which is the nuclear element of the teaching unit. The generating word, as proposed by Paulo Freire, should be used to achieve results beyond the goal of teaching how to read and write. Teaching entity Wr2 is mostly focused on the teaching how to read and write. The teacher may select a set of words and simultaneously define, for each word, which syllables to use in its construction, the opposite of the teaching unit Wr1 where the syllables were always the same for all the words. In addition, the teacher may also set some Wr2 features in order to help students in the word building process. As teaching entity Wr1, teaching entity Wr2 is divided into two other sub-entities 1) teaching template Wr2 which aims at the configuration of the teaching units Wr2; 2) teaching unit Wr2 which aims at teaching how to write.

3.2.1 Teaching Template Wr2

IN the configuration process the teacher must select a set of information in order to achieve the goals of teaching how to read and write through the teaching unit Wr2. For each teaching template Wr2, the teacher may define up to 15 words to be built by the students. For each word, teaching template Wr2 requires that the

teacher sets the following information: 1) one image to be associated with the word; 2) individual syllables to be used for word building; 3) besides these syllables, groups of syllables to be used in the process of building of the new words; 4) information about the word to be built that may be seen by the student, as the word itself or its individual syllables.

Figure 3 presents the teaching template Wr2 where the teacher sets as description Wr2 – iniciação (initiation) and for the first word:

- word selected: bola (ball)
- image: bola_d_c_1.jpg
- information to be seen: first and second syllable and also the word
- syllables: bo, la, be, bla and associated pronunciations
- groups of syllables: adjacents, homophonous and homographs

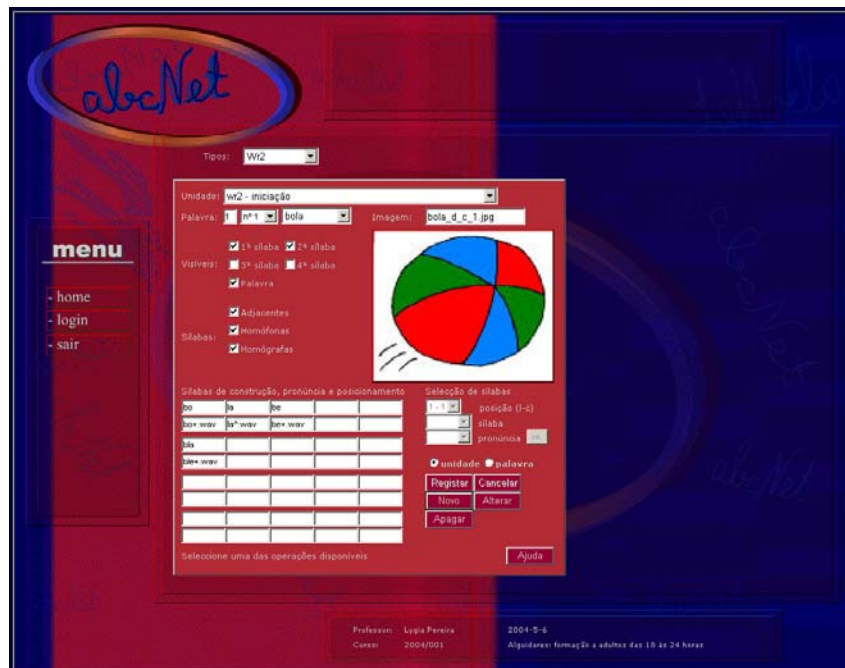


Figure 3. Teaching template wr2

Figure 4 presents the corresponding teaching unit Wr2.

3.2.2 Teaching unit Wr2

Teaching units Wr2 are those derived from the process of teaching template Wr2 configuration. The teaching template Wr2 may generate as many teaching units Wr2 as necessary. Each teaching unit Wr2 has a unique tag description and a maximum of 15 words to be built by the student. Teaching unit Wr2 is very similar to teaching unit Wr1. The differences are:

1. there is no generating word
2. the syllables to be used are defined in teaching template Wr2 and they are not the word family syllables
3. the teacher may decide what information can be seen by the student

All the elements have similar interactions as the ones mentioned for teaching unit Wr1.

Figure 4 shows the resulting teaching unit Wr2 from the teaching template presented in Figure 3, for the first word. All the information about the word to be built can be seen by the student: syllables and the word text.

The teaching unit Wr2 should be the first one being used for a literacy plan of teaching how to read and write. Here, the teacher may plan one or more teaching units, each one with several words, in order to make students familiar with the methodology used in abcNet for the teaching how to read and write.

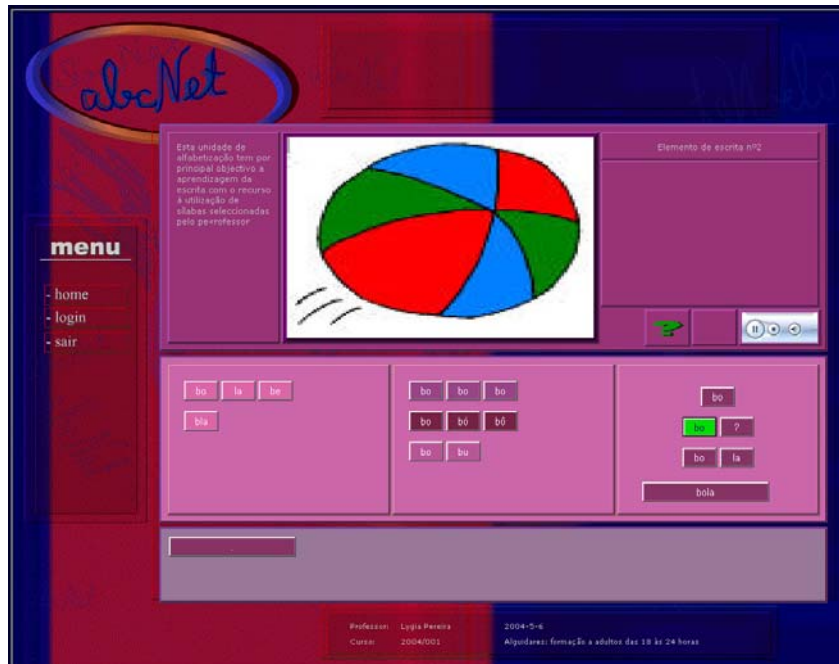


Figure 4. Teaching unit Wr2

4. COURSE PLANNING

The course planning should occur after the configuration of all teaching units and it is achieved by ordering all the teaching units. Each course plan can gather several teaching units. For each course, the teacher decides which teaching templates to use, how many teaching units to generate by each teaching template and the ordering of all the configured teaching units. For each teaching unit, the teacher decides which contents to use. We can conclude that the teacher has full control over the course.

5. CONCLUSION

abcNet is a web based application which has as its main aim putting at one's disposal contents to be used in the teaching of how to read and write. Its internal architecture is based on teaching entities that, through the teaching templates, let teachers generate teaching units for the purpose of teaching how to read and write. In a near future, other teaching entities will be developed in order to put other methods in practice. The basic entities flexibility allows the definition of a vast number of teaching entities, such as based on phonograms, syllables, etc.

abcNet may have the following disadvantages: 1) it requires a previous knowledge and training on how to use the application; 2) it requires an information platform prepared to fulfill the application needs. The requirements for the information platform consist of PC's with access to the internet and a web browser.

The flexibility of abcNet makes it suitable for students of any age as adults, teenagers or children by providing specific interfaces for each group. The presented interface is dedicated to adults.

REFERENCES

- Carlos Rodrigues Brandão. *O que é Método Paulo Freire*. Published by Editora Brasiliense, São Paulo, Brazil, 1981
- Celso Cunha e Lindley Cintra. *Nova Gramática do Português Contemporâneo*. Published by Edições João Sá da Costa, Lisboa, Portugal, 1991
- F. G. HalaszF_102_Pereira_edit. 1988. Reflections on Notecards: Seven issues for the next generation of hypermedia systems. *Communications of the ACM*, 31(7):836–852, July 1988.
- Henry Suzzallo. 2003. Reading, Teaching Beginners. <http://donpotter.net/PDF/Suzzallo%20Beginning%20Reading.pdf>.
- Óscar Narciso Mortágua Pereira et al. 2004. abcNet: a Literacy Tool in Developing Countries. Proceedings of The 4th IEEE International Conference on Advanced Learning Technologies. Joensuu, Finland, pp. 948-952.
- Paulo Freire. 1975. *Educação como Prática da Liberdade*. 1975. Published by Editora Paz e Terra, lda, Rio de Janeiro, Brazil.
- Paulo Freire. 1992. *A Importância do Acto de Ler*. Published by Cortez Editora, São Paulo, Brasil.
- Paulo Freire. 1996. *Pedagogia da Autonomia – saberes necessários à prática educativa*. Published by Editora Paz e Terra, São Paulo, Brazil.
- Rhona S. Jonhston et al. 2003. Accelerating Reading and Spelling with Synthetic Phonics: A Five Year Follow Up. <http://www.scotland.gov.uk/library5/education/ins4-00.asp>.
- Vera Lúcia camara F. Zacharias. 2003. O Método Sintético e o Analítico. <http://www.centrorefeducacional.pro.br/metodo.html>.